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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,564	04/06/2001	Yogendra Joshi	361007-000012	6497
24239	7590	03/21/2005	EXAMINER	
MOORE & VAN ALLEN PLLC			PATEL, NIHIR B	
P.O. BOX 13706			ART UNIT	
Research Triangle Park, NC 27709			PAPER NUMBER	
			3743	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/828,564

Applicant(s)

JOSHI ET AL.

Examiner

Nihir Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on June 9th, 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 4-6, 13, 15, 16 and 33-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 39-44 is/are rejected.
- 7) ☒ Claim(s) 23-32 and 36-38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06.28.2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 39 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Andres et al. US Patent No. 4,550,774. Referring to claim 1, Andres discloses a surface heating body for vehicles that does provide a central evaporator 4 in contact with the heat-dissipating component 11'; a condenser 7 in fluid communication with and extending around the periphery of the evaporator 4; a liquid coolant partially filling the condenser 7 and substantially filling the evaporator 4; and means for cooling the condenser.

Referring to claims 39 and 41, Andres discloses a surface heating body for vehicles that does provide a central evaporator 4 in contact with the heat-dissipating component 11'; a condenser 7 in fluid communication with and extending around the periphery of the evaporator 4; a liquid coolant partially filling the condenser 7 and substantially filling the evaporator 4 at all thermosyphon 10 orientations; and means for cooling the condenser 7, wherein thermosyphon performance is substantially independent of thermosyphon orientation (see column 1 lines 43-47).

Referring to claim 43, Andres discloses a surface heating body for vehicles that does provide a thermosyphon 10 comprising a central evaporator 4; a condenser 7 in fluid communication with and extending around the periphery of the evaporator 4; a liquid coolant

partially filling the condenser 7 and substantially filling the evaporator 4; and means for cooling the condenser 7; and placing the evaporator in contact with the heat dissipating element 11'.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 7, 12, 17 through 22, 25, 32, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andres et al. US Patent No. 4,550,774 in view of Ghoshal US Patent No. 6,474,074. Referring to claims 2, 3, 17 through 22, 25, 32, 40 and 42, Andres discloses the applicant's invention as claimed with the exception of providing cooling means that comprises cooling fins that extend from the condenser. Ghoshal discloses an apparatus for dense chip packaging using heat pipes and thermoelectric coolers that does provide cooling means that comprises cooling fins that extend from the condenser (see figure 3). It is obvious to modify Andres's invention by providing cooling means that comprises cooling fins that extend from the condenser as taught by Ghoshal in order to improve the heat transfer process.

Referring to claim 7, Andres discloses the applicant's invention as claimed with the exception of providing a boiling enhancement structure that is disposed within the evaporator. Ghoshal discloses an apparatus for dense chip packaging using heat pipes and thermoelectric coolers that does provide a boiling enhancement structure that is disposed within the evaporator. Therefore it would have been obvious to modify Andres's invention by providing a boiling

enhancement structure that is disposed within the evaporator as taught by Ghoshal in order to improve the heat transfer process.

Referring to claim 12, Andres discloses the applicant's invention as claimed with the exception of providing an evaporator that comprises a first plate having an interior major surface and an exterior major surface; a second plate generally parallel to, spaced from and similar in planar dimension to the first plate, having an interior major surface and an exterior major surface, the interior major surface opposing the interior major surface of the first plate with a central parallel plane passing through the space therebetween, the second plate exterior major surface in contact with at least a portion of the component and extending outside the limits of that portion of the component, wherein the interior major surfaces define an evaporator volume. Ghoshal discloses an apparatus for dense chip packaging using heat pipes and thermoelectric coolers an evaporator that comprises a first plate having an interior major surface and an exterior major surface; a second plate generally parallel to, spaced from and similar in planar dimension to the first plate, having an interior major surface and an exterior major surface, the interior major surface opposing the interior major surface of the first plate with a central parallel plane passing through the space therebetween, the second plate exterior major surface in contact with at least a portion of the component and extending outside the limits of that portion of the component, wherein the interior major surfaces define an evaporator volume. Therefore it would have been obvious to modify Andres's invention by an evaporator that comprises a first plate having an interior major surface and an exterior major surface; a second plate generally parallel to, spaced from and similar in planar dimension to the first plate, having an interior major surface and an exterior major surface, the interior major surface opposing the interior major surface of

the first plate with a central parallel plane passing through the space therebetween, the second plate exterior major surface in contact with at least a portion of the component and extending outside the limits of that portion of the component, wherein the interior major surfaces define an evaporator volume as taught by Ghoshal in order to improve the heat transfer process.

Referring to claim 17, Andres discloses the applicant's invention as claimed with the exception of providing a first plate that is above the second plate and wherein the liquid coolant fills the evaporator. Ghoshal discloses an apparatus for dense chip packaging using heat pipes and thermoelectric coolers an evaporator that does provide a first plate that is above the second plate and wherein the liquid coolant fills the evaporator. Therefore it would have obvious to modify Andres's invention by providing a first plate that is above the second plate and wherein the liquid coolant fills the evaporator as taught by Ghoshal in order to improve the heat transfer process.

Claims 8-11, 18-22, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andres et al. US Patent No. 4,550,774 in view of Anderson et al. US Patent No. 5,761,037. Referring to claim 8, Andres discloses the applicant's invention as claimed with the exception of providing boiling enhancement structure that comprises a plate having a first major surface and a second major surface both surfaces having parallel grooves cut in them, the grooves in the first surface being perpendicular to the grooves in the second surface. Anderson discloses an orientation independent evaporator that does provide boiling enhancement structure that comprises a plate having a first major surface and a second major surface both surfaces having parallel grooves cut in them, the grooves in the first surface being perpendicular to the grooves in the second surface (see figure 3A). Therefore it would have been obvious to modify Andres's

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invention by providing boiling enhancement structure that comprises a plate having a first major surface and a second major surface both surfaces having parallel grooves cut in them, the grooves in the first surface being perpendicular to the grooves in the second surface as taught by Anderson in order to obtain better heat transfer.

Referring to claim 9, Andres discloses the applicant's invention as claimed with the exception of providing grooves in each surface that are cut to a depth that is at least one half of the thickness of the boiling enhancement structure plate. Anderson discloses an orientation independent evaporator that does provide grooves in each surface that are cut to a depth that is at least one half of the thickness of the boiling enhancement structure plate. Therefore it would have been obvious to modify Andres's invention by providing grooves in each surface that are cut to a depth that is at least one half of the thickness of the boiling enhancement structure plate as taught by Anderson in order to obtain better heat transfer.

Referring to claim 10, Andres discloses the applicant's invention as claimed with the exception of providing a boiling enhancement structure material that is selected from the group consisting of copper, diamond, and silicon. Anderson discloses an orientation independent evaporator that does provide a boiling enhancement structure material that is selected from the group consisting of copper, diamond, and silicon (see column 4 lines 1-5 and lines 30-40). Therefore it would have been obvious to modify Andres's invention by providing a boiling enhancement structure material that is selected from the group consisting of copper, diamond, and silicon as taught by Anderson in order to obtain better heat transfer.

Referring to claim 11, Andres discloses the applicant's invention as claimed with the exception of providing a boiling enhancement structure that comprises open-celled porous foam.

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Anderson discloses an orientation independent evaporator that does provide a boiling enhancement structure that comprises open-celled porous foam (see column 3 lines 55-65 and column 4 lines 1-10). Therefore it would have been obvious to modify Andre's invention by providing a boiling enhancement structure that comprises open-celled porous foam as taught by Anderson in order to obtain better heat transfer.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andres et al. US Patent No. 4,550,774 in view of Paal US Patent No. 5,051,814. Andres discloses the applicant's invention as claimed with the exception of providing a second plate that is formed with at least a portion of the heat-dissipating component from a single piece of material. Paal discloses a method of providing stress-free thermally conducting attachment of two bodies that does provide a second plate that is formed with at least a portion of the heat-dissipating component from a single piece of material (see figure 1). Therefore it would have been obvious to modify Andres's invention by providing a second plate that is formed with at least a portion of the heat-dissipating component from a single piece of material as taught by Paal in order to improve the heat transfer process.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andres et al. US Patent No. 4,550,774 in view of Larson et al. US Patent No. 5,704,416. Andres discloses the applicant's invention as claimed with the exception of providing a void in the evaporator to allow the coolant to directly contact the heat-dissipating element. Larson discloses a two-phase component cooler that does provide a void in the evaporator to allow the coolant to directly contact the heat-dissipating element (see column 8 lines 38-47). Therefore it would have been obvious to modify Andres's invention by providing a void in the evaporator to allow the coolant

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to directly contact the heat-dissipating element as taught by Larson in order to improve the cooling process.

Allowable Subject Matter

Claims 23 through 32 and 36 through 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

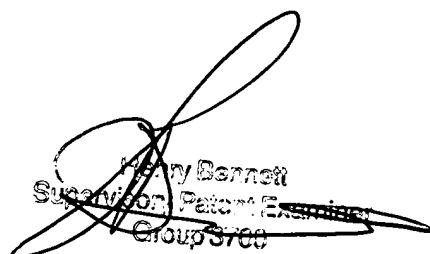
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Nihir Patel whose telephone number is (571) 272-4803. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful the examiner supervisor Henry Bennett can be reached at (571) 272 4791.

NP

March 8th, 2005


Henry Bennett
Supervisor, Patent Examiner
Group 3743

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